

REMARKS

Favorable reconsideration of this application in light of the following discussion is respectfully requested.

Claims 1, 4, 6, 9, 10, 12, 15, 19-24, 26, and 29-37 are presently active in this case. Claims 1, 6, 10, 12, 15, 19-22, 24, and 26 have been amended herein, Claims 2, 3, 5, 7, 8, 11, 13, 14, 16-18, 25, 27, and 28 have been canceled without prejudice or disclaimer, and Claims 29-37 have been added. No new matter has been entered. Support for the claim amendments can be found throughout the specification (see, e.g., page 9, line 15, through page 10, line 4), and in the previously pending claims.

Claims 1, 4, 12, and 21-24 were rejected under 35 U.S.C. 103(a) as being unpatentable over Khan et al. (U.S. Pub. No. 2002/0164417). Claims 1, 4, and 21-23 were rejected under 35 U.S.C. 103(a) as being unpatentable over Rigney et al. (U.S. Patent No. 6,274,193) in view of Rigney et al. (U.S. Patent No. 6,042,880) and Khan et al. Claims 6, 9, 15, and 19 were rejected under 35 U.S.C. 103(a) as being unpatentable over Khan et al. in view of Sangeeta et al. (U.S. Patent No. 6,485,780). Claims 6, 9, and 19 were rejected under 35 U.S.C. 103(a) as being unpatentable over Rigney '193 in view of Rigney '880, Khan et al. and further in view of Sangeeta et al. Claims 10 and 26 were rejected under 35 U.S.C. 103(a) as being unpatentable over Khan et al. or Rigney '193 in view of Rigney '880, Khan et al. and further in view of Alperine et al. (EP 1085109 A1). Claim 20 was rejected under 35 U.S.C. 103(a) as being unpatentable over either Khan et al. in view of Sangeeta et al. or Rigney '193 in view of Rigney '880, Khan et al. and Sangeeta et al. and further in view of

Alperine et al. For the reasons discussed below, the Applicants request the withdrawal of the obviousness rejections.

Claims 18, 27, and 28 were indicated as being allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The subject matter of allowable Claims 18, 27, and 28 has been incorporated into independent Claims 1, 6, and 21, respectively. The Applicants note that the term "excellent" has been removed from the claims; however, the Applicants submit that this change does not affect patentability thereof. Thus, Claims 1, 6, and 21 and all of the claims that depend therefrom are allowable. Accordingly, the Applicants respectfully request the withdrawal of the art rejections.

Newly added Claims 29 and 34 are allowable as they recite features that are not disclosed or suggested by the cited art, either when taken singularly or in combination.

Claim 29 advantageously recites a method of repairing a Ni-based alloy part having an undercoat layer and a topcoat layer stacked on a Ni-based alloy base when the topcoat layer is damaged, comprising the steps of: removing a damaged portion of the topcoat layer without removing all of the topcoat layer and removing a denatured portion of the undercoat layer corresponding to the damaged portion; applying spray without using slurry by spray gun to a removed portion, where the undercoat layer has been removed, to form another undercoat layer at reduced pressure, a spray particle speed of less than 300 m/s, and a base-material temperature of 600°C or less; and subsequently without heat treatment forming another topcoat layer formed of ZrO₂-based ceramics only the damaged portion of the topcoat

layer, wherein said topcoat layer and said another topcoat layer are formed of different materials.

Claim 34 advantageously recites a method of repairing a Ni-based alloy part having an undercoat layer and a topcoat layer stacked on a Ni-based alloy base when the topcoat layer is damaged, comprising the steps of: removing a damaged portion of the topcoat layer without removing all of the topcoat layer and removing a denatured portion of the undercoat layer corresponding to the damaged portion; applying spray without using slurry by spray gun to a removed portion, where the undercoat layer has been removed, to form another undercoat layer in an atmosphere at a spray particle speed of 300 m/s or more and a base-material temperature of 300°C or less; and subsequently without heat treatment forming another topcoat layer formed of ZrO₂-based ceramics only at a portion where the topcoat layer has been damaged, wherein said topcoat layer and said another topcoat layer are formed of different materials.

The inventions described in the Khan et al. reference and the Sangeeta et al. reference relate to a spraying method of a slurry, which is contrary to the above claimed invention. (See, e.g. Claims 1, 2, and 7, and paragraphs [0014], [0015], and [0021] of the Khan et al. reference, and Claim 1 and column 6, lines 2-5, and column 6, line 62 through column 7, line 3 of the Sangeeta et al. reference.) In the plasma spray method recited in Claims 29 and 34, it is unnecessary to prepare a slurry and remove a solvent (volatile component). By way of illustration and not limitation, in a plasma spray method, the metal or ceramics powder are in a melted state or half melted state by the flame, and thus, the melted substances bond to each

other on the target material (damaged portion of a base-material), and the bonding strength between the particles and between the particles and base-material is strong.

In the spraying methods of the Khan et al. reference and the Sangeeta et al. reference, the surface of the film is smooth, as a solvent (volatile component) is removed when forming the film. According to the method of the Rigney '193 reference, the surface of an undercoat layer is smooth, as the undercoat layer is heat treated after deposition of a repair material. Thus, in the Rigney '193 reference, the peeling of the topcoat layer can easily occur from the undercoat layer. On the other hand, Claims 29 and 34 recite methods in which spray is applied without using slurry by spray gun to a removed portion, where the undercoat layer has been removed, to form another undercoat layer under the claimed conditions, and subsequently without heat treatment, forming another topcoat layer formed of ZrO_2 -based ceramics only at the damaged portion. Using such methods, the surface roughness of the undercoat layer can be maintained, and when the recited topcoat layer is formed on such an undercoat layer, the bonding strength between the topcoat layer and the undercoat layer is strong, and peeling is unlikely to occur in such a film structure. By maintaining the surface roughness using the claimed plasma spray, air holes can be formed in a topcoat layer when the layer is formed by the half-melted or melted repair material, and due to the air holes, a film having high heat insulation can be formed. However, in the spraying method of Khan et al. reference, a solvent (volatile component) is removed when forming a film, and there are not many air holes. Thus, the heat insulation effect is smaller than in a film formed by a plasma spray method.

The Applicants submit that the new claims are allowable over the cited references,

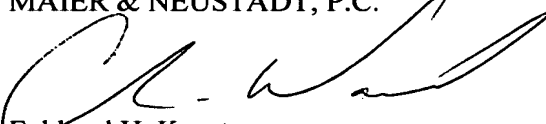
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either when the references are taken singularly or in combination, for at least the reasons discussed above.

Consequently, in view of the above discussion, it is respectfully submitted that the present application is in condition for formal allowance and an early and favorable reconsideration of this application is therefore requested.

Respectfully Submitted,

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